

2017 Annual Report on Oil and Gas Activities

State Oil and Gas Council Meeting – April 18, 2018

Larry “Boot” Pierce, RG
Missouri Geological Survey

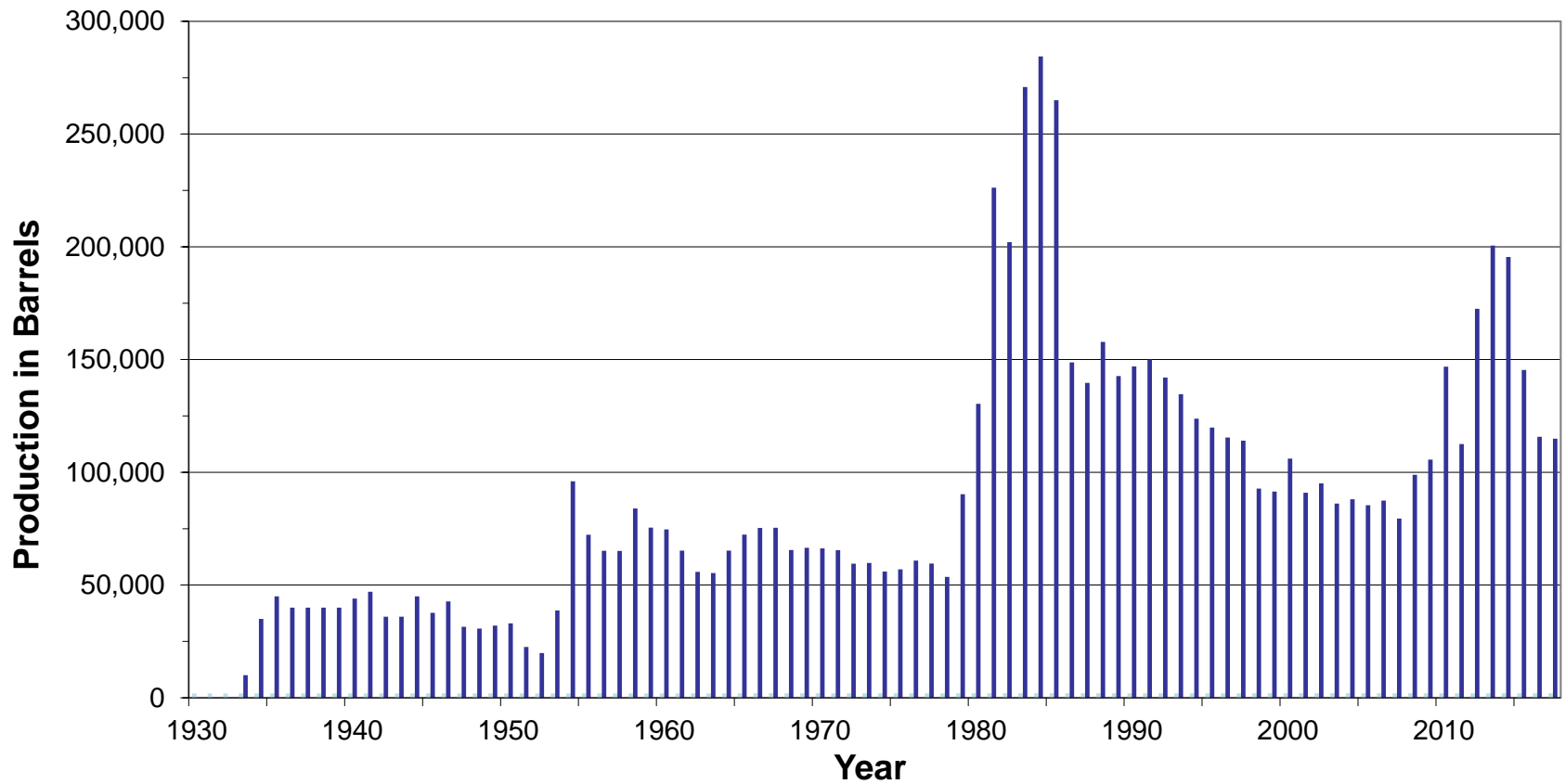
Oil Production in 2017

- 443 active producing oil wells
- 114,895 barrels of oil produced
- Valued at about \$4.80 million
- Price per barrel ranged \$31.95 – \$52.24
- Currently produced in 5 counties
- 21 licensed operators
- 19 companies operating
- 12 companies reported production

Average Price for Missouri Oil

- Average price per barrel in 2017 – \$41.48
– (↑~26%) (ranging from \$31.95 to \$52.24)
- Average price per barrel in 2016 – \$32.77
– (↓~14%) (ranging from \$17.13 to \$48.14)
- Average price per barrel in 2015 – \$38.71
– (↓~47%) (ranging from \$24.00 to \$53.30)
- Average price per barrel in 2014 – \$82.38
– (↓~7%) (ranging from \$45.50 to \$98.20)
- Average price per barrel in 2013 – \$86.82
– (↑~6%) (ranging from \$75.74 to \$91.32)

Historic Oil Production

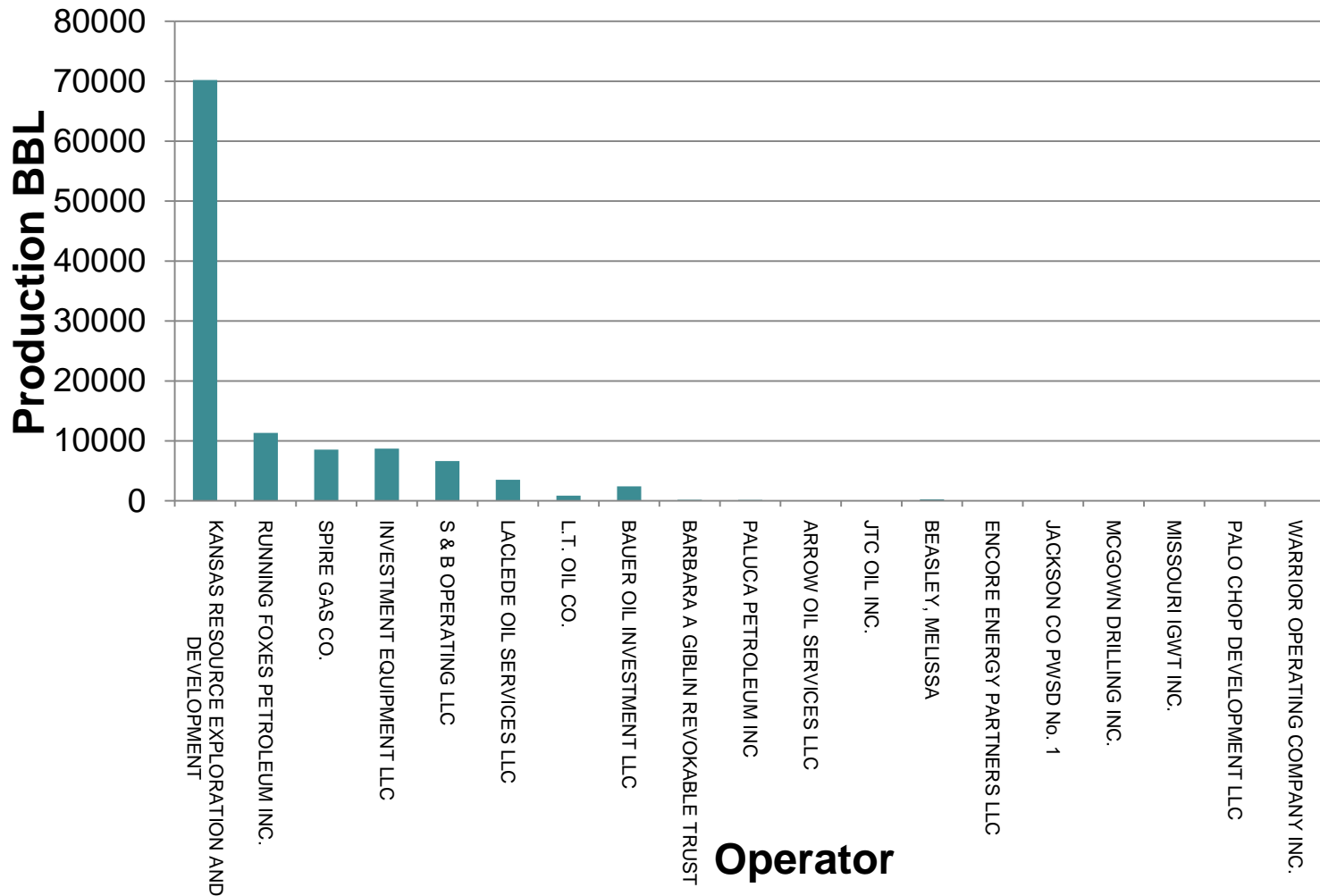


2017 Crude Oil Production by Operator

| Operator | BBLs of Oil | Percent of Total Production |
|---|-------------|-----------------------------|
| KANSAS RESOURCE EXPLORATION AND DEVELOPMENT | 71732 | 0.624 |
| RUNNING FOXES PETROLEUM INC. | 11335 | 0.099 |
| SPIRE GAS CO. | 8545 | 0.074 |
| INVESTMENT EQUIPMENT LLC | 8718 | 0.076 |
| S & B OPERATING LLC | 7147 | 0.062 |
| LACLEDE OIL SERVICES LLC | 3524 | 0.031 |
| L.T. OIL CO. | 863 | 0.008 |
| BAUER OIL INVESTMENT LLC | 2405 | 0.021 |
| BARBARA A GIBLIN REVOKABLE TRUST | 184 | 0.002 |
| PALUCA PETROLEUM INC | 150 | 0.001 |
| ARROW OIL SERVICES LLC | 0 | 0.000 |
| JTC OIL INC. | 38 | 0.000 |
| BEASLEY, MELISSA | 253 | 0.002 |
| ENCORE ENERGY PARTNERS LLC | 0 | 0.000 |
| JACKSON CO PWSD No. 1 | 0 | 0.000 |
| MCGOWN DRILLING INC. | 0 | 0.000 |
| MISSOURI IGWT INC. | 0 | 0.000 |
| PALO CHOP DEVELOPMENT LLC | 0 | 0.000 |
| WARRIOR OPERATING COMPANY INC. | 0 | 0.000 |
| BRANT ENERGY | 0 | 0.000 |
| BLACKSTAR 231 | 0 | 0.000 |

2017 Total Crude Oil Production – 114,895 bbls

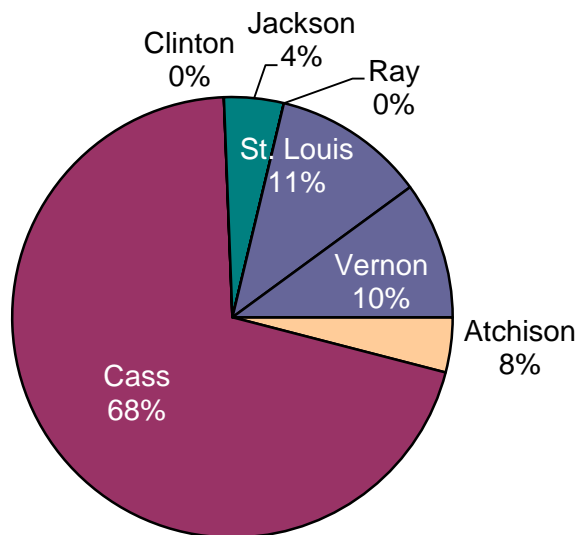
2017 Crude Oil Production by Operator





2017 Oil Producing Counties

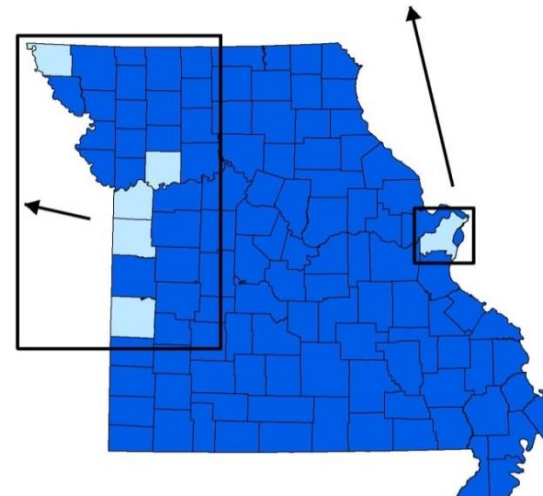
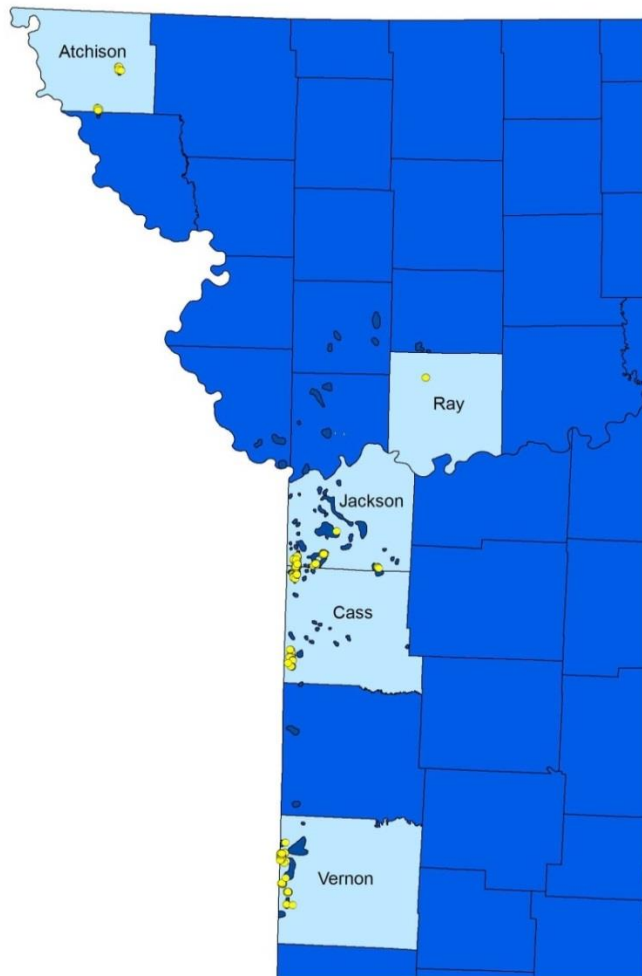
| County | BBL's of Oil | Production Value |
|-----------|--------------|------------------|
| Atchison | 9,351 | 377,460 |
| Cass | 77,670 | 3,266,001 |
| Clinton | 0 | 0 |
| Jackson | 4,953 | 207,849 |
| Ray | 0 | 0 |
| St. Louis | 12,070 | 518,962 |
| Vernon | 10,852 | 432,316 |



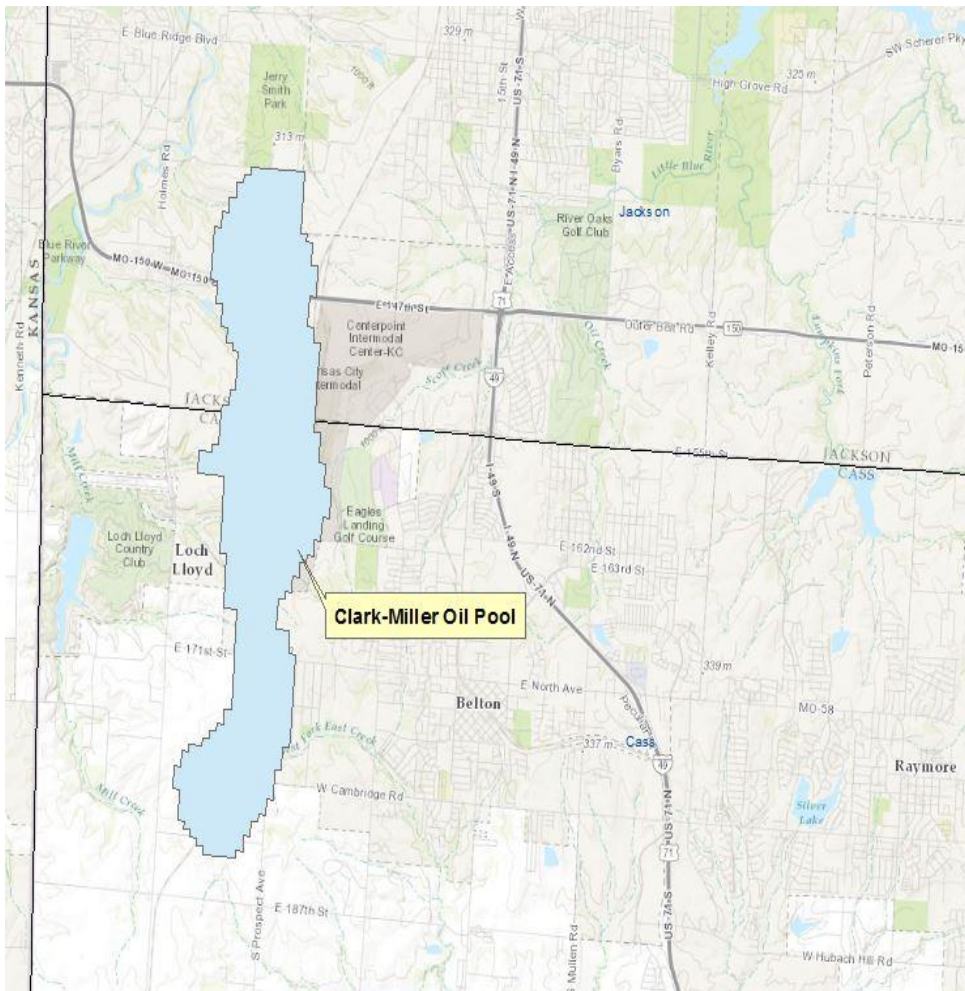
Total Production 114,895 bbls

Total Value \$4.8 Million

Oil Producing Counties and Known Fields



Top Producing County and Pool



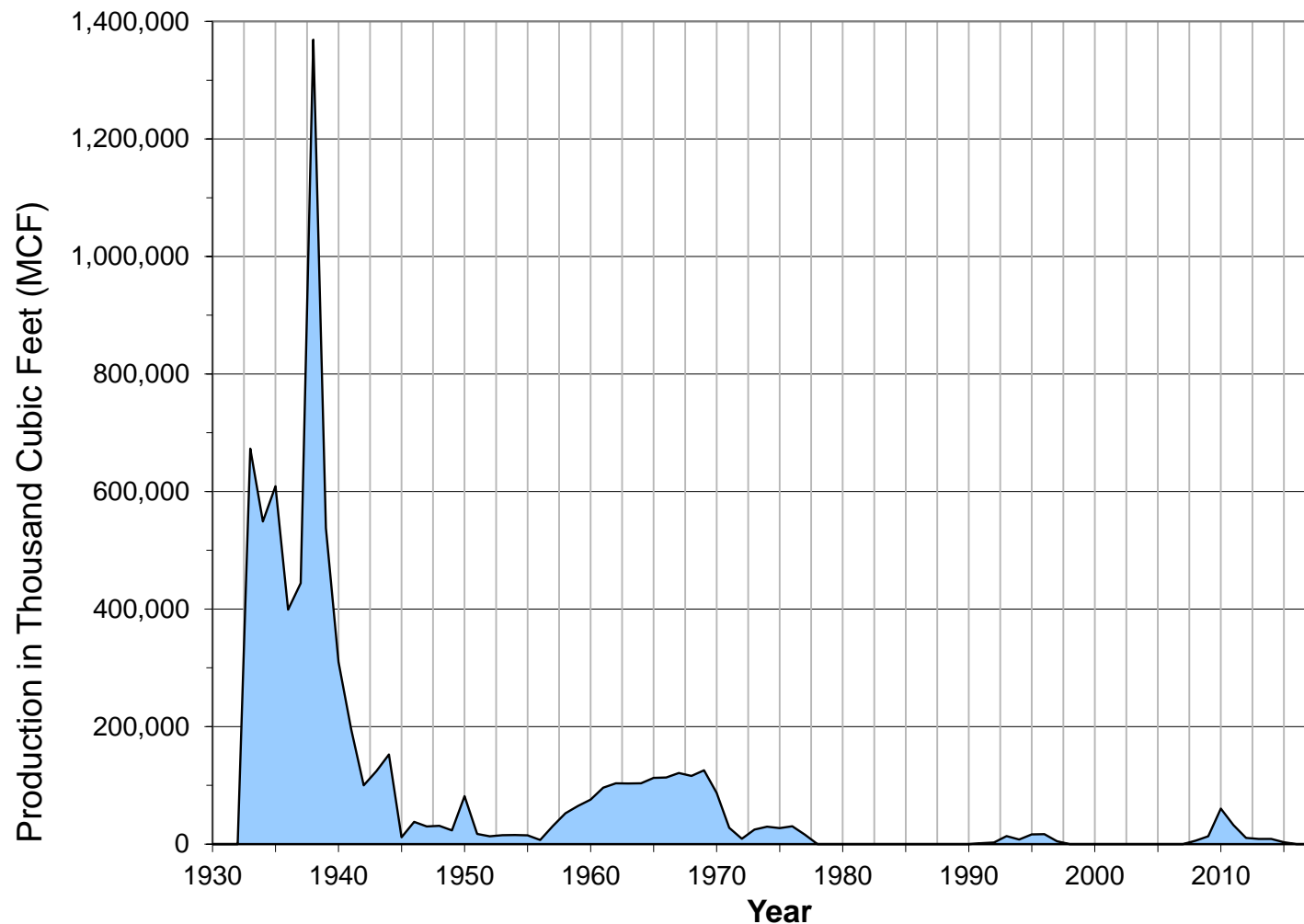
Top Oil Producing County
- Cass County
77,670 bbls
70 percent of the total oil
produced in Missouri

Top Oil Producing Pool
Clark-Miller Oil Pool
73,482 bbls
65 percent of total oil
produced in Missouri

2017 Commercial Gas Production

- 1 active producing commercial gas well
- More than 826 MCF of gas produced
- Valued at more than – none sold
- Price per MCF averaged – none sold
- 0 percent in Vernon County, 0 percent in Clinton
- 1 active companies – given to homeowners
- 0 inactive companies

Historic Commercial Gas Production



Missouri's Private Gas Wells

- 459 private gas wells
- 45 are active
 - 34 are in Cass County
- Five counties have active private gas wells
 - Cass, Caldwell, Clay, Clinton and Jackson
- Production reporting is exempted

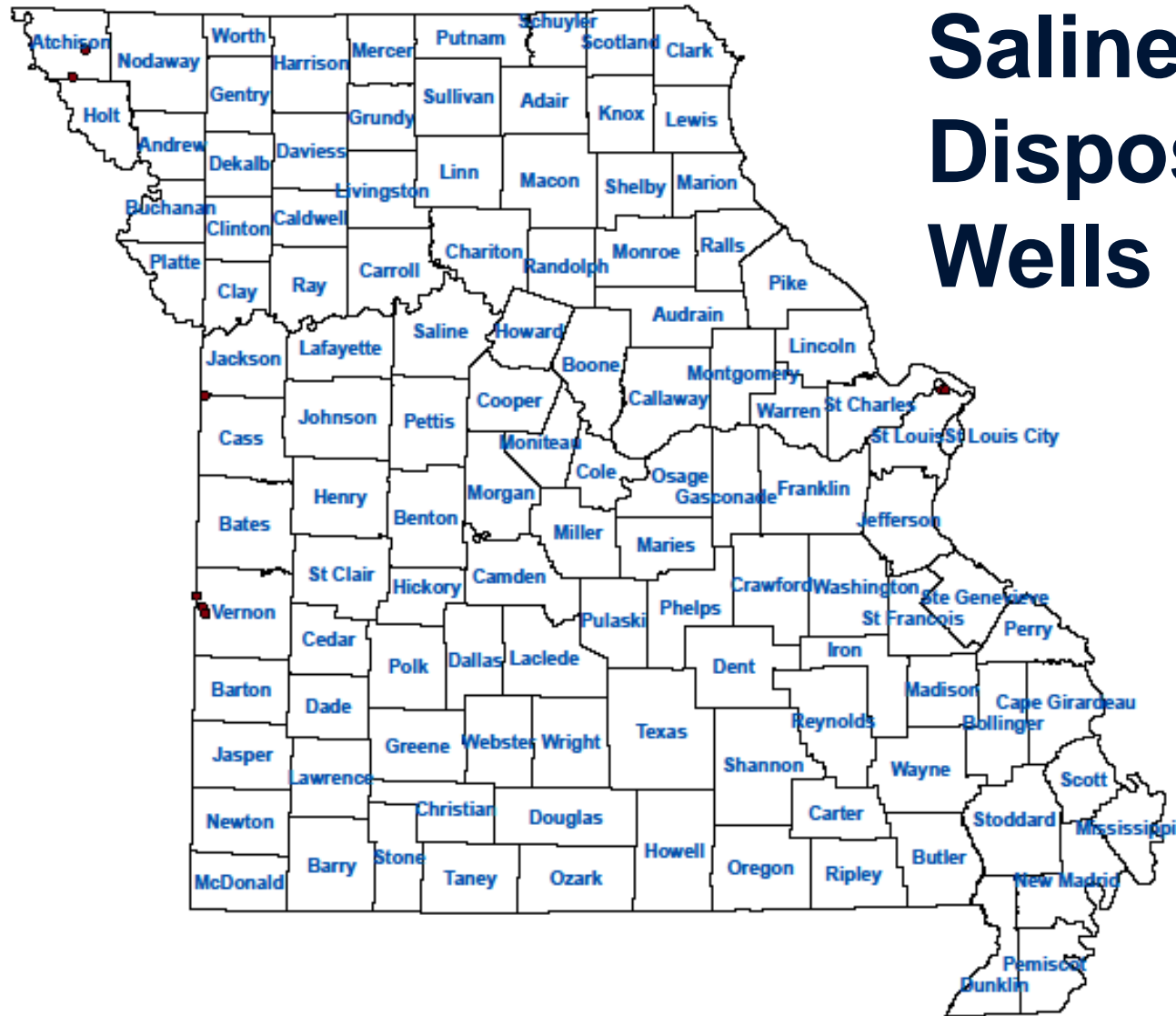


Class II Injection Wells

- Wells that inject fluids in connection with oil/gas production
 - Disposal of produced salt water
 - Injection of fluids for enhance recovery
- Missouri has 360 active Class II Wells
 - (372 active wells in 2016)
 - Saline Water Disposal – 7
 - Enhanced Oil Recovery – 352
 - Abandoned Class II wells – 63



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Saline Water Disposal Wells – 7



Enhance Recovery Wells –

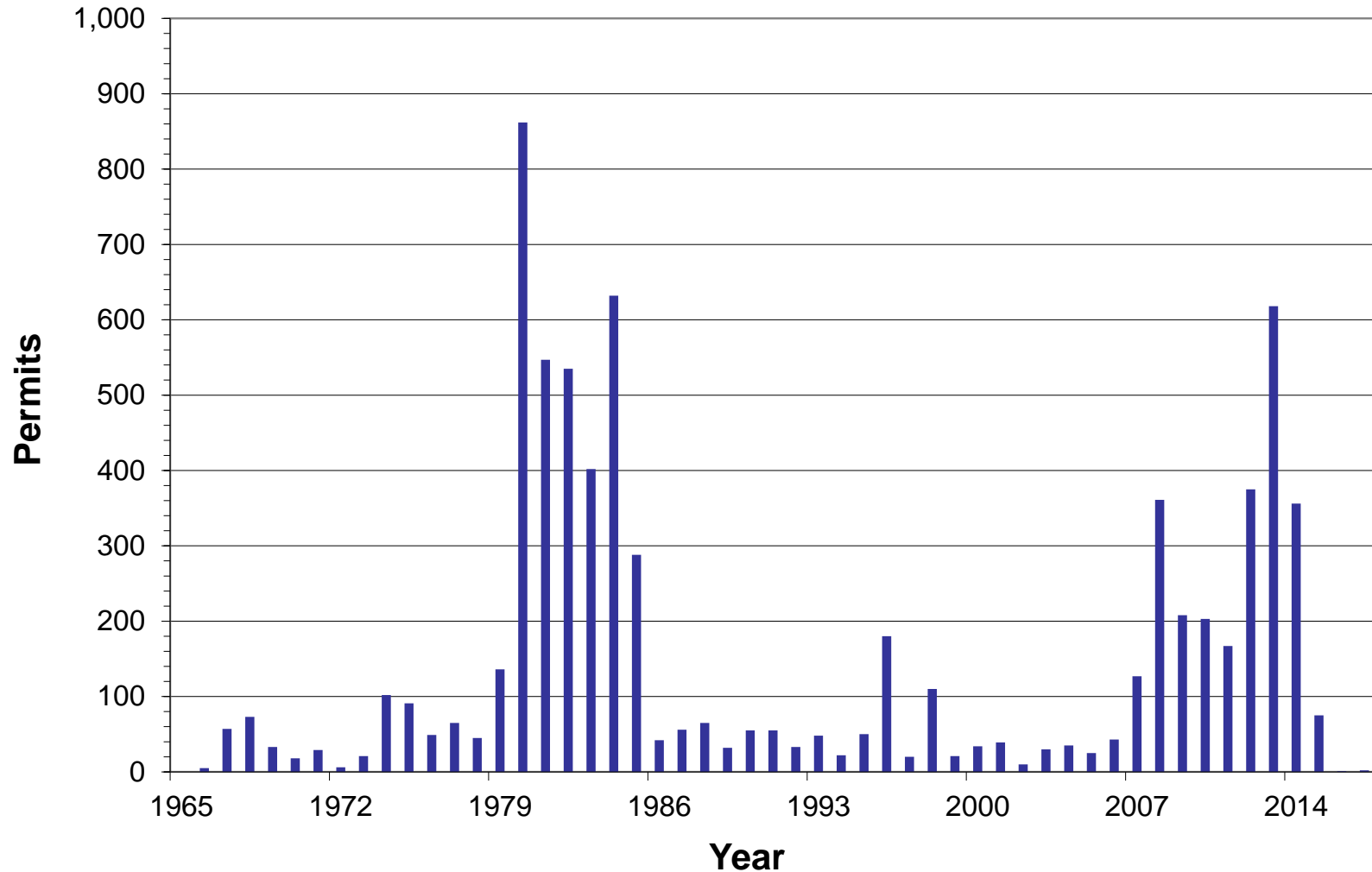
2017 Permits Issued

| | | |
|----------------|---|------------------|
| Cass County | 1 | Private gas well |
| Nodaway County | 1 | Blanket permit |
| Total permits | 2 | |



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Historic Permitting



2017 Well Permits by Type

| Well Type | Total | Active | Under Construction | Shut-in | Temporarily Abandoned | Plugged | Cancelled |
|--------------------|-------|--------|--------------------|---------|-----------------------|---------|-----------|
| Oil Production | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Injection EOR | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Injection SWD | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Stratigraphic Test | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Observation | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Private Gas | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| Commercial Gas | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Area Permits | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| Total | 2 | 0 | 2 | 0 | 0 | 0 | 0 |

Wells Plugged

Includes oil, gas, injection, stratigraphic test

- 2011 – Wells Plugged = 34
- 2012 – Wells Plugged = 44
- 2013 – Wells Plugged = 348
- 2014 – Wells Plugged = 354
- 2015 – Wells Plugged = 139
- 2016 – Wells Plugged = 129
- 2017 – Wells Plugged = 31

2017 Mechanical Integrity Tests and Lease Visits

- MITs were performed on 41 wells
 - MGS staff witnessed 0 percent
- Well inspections performed 151
- Lease visits performed 55
- Prepped and plugged 0 abandoned wells with Oil and Gas remedial funds
- Responded to 948+ oil/gas phone calls and inquiries

2017 Enforcement Actions

- Compliance Assistance Letters = 37
- Letters of Warning = 7
 - Cases started at LOW = 0
- Notice of Violations = 1
- Total Cases = 47
 - Resolved cases = 32
 - Resolved at CA letter = 25
- Some cases resolved in 2017 were from previous year

Missouri Total Open Wells

| Item | Well Type | Number of Wells |
|--|----------------------|-----------------|
| Total Open Wells | | 6,131 |
| | Post-Law Wells | 1,454 |
| | Pre-Law Well | 4,677 |
| | | |
| Abandoned Wells | | 4,908 |
| | Post-Law Commercial | 350 |
| | Post-Law Private Gas | 8 |
| | Pre-Law Commercial | 4,114 |
| | Pre-Law Private Gas | 397 |
| | | |
| 80 percent of all open wells are abandoned | | |
| 91.8 percent of all abandoned wells are commercial wells | | |
| | | As of 3-1-2018 |

Fund and Bonding Balances

- Oil and Gas Remedial Fund balance as of March 1, 2018
 - \$9,008
- Oil and Gas Resource Fund balance as of March 1, 2018
 - \$70,889
- Total Bonding held as of Feb. 1, 2018
 - \$1,465,397

Comparison of 2015, 2016 and 2017

| Item | 2015 | 2016 | 2017 |
|---|-------------|-------------|-------------|
| Active Oil Wells | 523 | 559 | 443 |
| Oil Production in bbl | 147,359 | 115,765 | 114,895 |
| Average Price/bbl | \$38.71 | \$32.77 | \$41.48 |
| Total Oil Value* | \$5,790,433 | \$3,835,648 | \$4,802,587 |
| Active Gas Wells | 7 | 14 | 1 |
| Gas production in MCF | 3,175 | 1090 | 820 |
| Average Price/MCF | \$2.63 | \$0 | \$0 |
| Total Gas Value* | \$8,350 | \$0 | \$0 |
| | | | |
| Permits | 75 | 1 | 2 |
| Wells Inspected | 231 | 233 | 151 |
| MITs Performed | 126 | 26 | 41 |
| MITs Witnesses | 43 | 0 | 0 |
| Leases Inspected | 21 | 51 | 55 |
| Phone Inquiries | 1,276 | 1,090 | 948 |
| * Total commodity value based on price at which commodity was sold, not the average commodity price | | | |



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Questions?

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Oil and Gas Unit Updates and Upcoming Council Activities

State Oil and Gas Council Meeting – April 18, 2018

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Unit Activities

- Unit is working with ITSD on enhancements to the oil and gas database
 - Was built a few years ago, but we are correcting an issue related to the database structure
- Currently performing an internal audit of the bonding process
- Working on standard operating procedures for all positions within the unit

Upcoming Council Activities

- Public hearing for amendments to 10 CSR 50-1, 10 CSR 50-3, 10 CSR 50-3 is tentatively scheduled for Sep. 6, 2018.
- Once the comment period is completed and all comments addressed, the council will be presented with the approved rule amendments to vote on at the Oct. 17, 2018, Oil and Gas Council meeting.



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